

# A new species and notes on the genus *Anthoxanthum* L. (Poaceae)<sup>1</sup>

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*Botanical Survey of India, Calcutta*  
(With three text-figures)

A new grass *Anthoxanthum borii* is described. A dichotomous key is provided for identification of the six species of the genus *Anthoxanthum* L., occurring in India. Important distinguishing characters of the new species are also illustrated in a text-figure. Some critical notes on the identity of certain taxa are given.

## INTRODUCTION

The genus *Anthoxanthum* L. was formerly included in the tribe Phalarideae of the subfamily Pooideae (Hooker, 221; Bor, 163, 1940; Hitchcock, 549); it is now placed in the tribe Aveneae (Bor, 431, 1960; Hubbard, 433).

*Anthoxanthum* L. is a large genus of about 50 species and numerous varieties (Chase & Niles 1962), distributed in almost all continents, particularly in Europe, the Mediterranean region and Old World.

The material of the genus from the herbaria at Shillong (*ASSAM*), Coimbatore (*MH*) and Calcutta (*CAL*) was examined; this included two type specimens of *A. hookeri* (Griseb.) Rendle and *A. sikkimense* (Maxim.) Ohwi.

Four species, namely *A. clarkei* (Hook. f.) Ohwi; *A. hookeri* (Griseb.) Rendle, *A. odoratum* L. and *A. sikkimense* (Maxim.) Ohwi are reported to occur in different parts of India, particularly in the eastern Himalayas and peninsular India. *A. puelii* Lec. & Lam., a grass from southern Europe, is comparatively a recent introduction in India.

One new species occurring in south India was discovered.

***Anthoxanthum* L.** Gen. Pl. ed. 5:17, 1754.

Annual or perennial. *Leaves* up to about 10 mm wide. *Inflores-*

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<sup>1</sup> Accepted November 14, 1972.

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cence a spiciform or lax panicle. *Spikelets* oblong to linear-lanceolate, slightly laterally compressed, rhachilla disarticulating above the glumes. *Glumes* 2, persistent, 1-3-nerved, 1-keeled, acute or acuminate, upper longer. *Florets* 3, heteromorphous; *first (lowest) floret* male, sometimes barren; *lemma* oblong-lanceolate, 5-7-nerved, hairy, shortly awned; *palea* 2-keeled, *lodicules* 0; *stamens* 3; *second (middle) floret* barren. *Lemma* and *palea* similar to that of lowest floret; *awn* longer, kneed, arising from near the base or from the middle. *Third (terminal) floret* hermaphrodite; *Lemma* much shorter than the lower two, broadly elliptic-lanceolate, delicately 1-7 nerved; *palea* 1-nerved; *lodicules* 0; *stamens* 2; *styles* distinct; *stigmas* 2, long, exserted from the tip of the spikelet, plumose. *Grain* ovoid, slightly laterally compressed.

*Etymology*: *anthos*: flower; *xanthos*: yellow, refers to pale yellowish inflorescence. Type species: *A. odoratum* L.

## KEY TO SPECIES

1. Spikelets less than 5 mm long; awns projecting,  $\pm$  equal to the spikelet itself ..... *A. sikkimense*
1. Spikelets more than 5.5 mm long; awns projecting equal to, or much less than, the spikelet:
  2. Spikelets very shortly awned, awn not projecting more than 2 mm beyond the spikelet:
    3. Perennial; culms unbranched ..... *A. odoratum*
    3. Annual; culms branched, geniculate below ..... *A. puelii*
  2. Spikelets with long awns, awns projecting more than 2 mm beyond the spikelet:
    4. Spikelets about 5.5 mm long; pedicels glabrous; lower and upper glumes acute (not acuminate); lemmas densely brownish hairy ..... *A. clarkei*
    4. Spikelets more than 6 mm long; pedicels glabrous or hairy, lower and upper glumes acuminate, lemmas less hairy, hairs hyaline:
      5. Culms unbranched; leafblades up to 5 mm broad; ligule longer than broad; pedicels glabrous; lower glume about half as long as the upper, rarely more; inflorescence slender loose ..... *A. hookeri*
      5. Culms branched; leafblades up to 10 mm broad; ligule broader than long; pedicels hairy; lower glumes usually exceeding half the upper glume; inflorescence congested ..... *A. borii*

The distinguishing characters of the new species have also been illustrated in the plate. In the following account, the species are arranged alphabetically. The new species is described in detail; for others, full descriptions are omitted as they are available in published literature, to which references have been cited.

***Anthoxanthum borii* sp. nov. (Figs. 1-3)**

*Anthoxanthum borii* sp. nov. similis *A. hookeri* sed culmis ramosis, foliorum laminis latoribus, pedicellis pilosis, paniculis congestis differt.

Holotype: Pulneys, Pambar stream, near Shenthadikanaal, 6-xii-1898. Bourne 1954 (CAL).

*Anthoxanthum borii* sp. nov. resembles *A. hookeri* (Griseb.) Rendle but differs in having branched culms, broad leaf blades, hairy pedicels and congested panicles.

A perennial rhizomatous grass, culms branched, erect, slender 0.6-1 m tall. Roots shallow. *Leaf sheaths* compressed, glabrous, slipping, from the culms; *leaf blades* linear, 8-30 cm long, 4-10 mm wide, rounded at the base, acute, glabrous or sparsely hairy; *ligule* truncate, membranous, hyaline, up to 3 mm long. *Inflorescence* a congested panicle, up to about 13 cm long, 2 cm wide; racemes short. *Spikelets* oblong-lanceolate, including the awn: 8-10 mm long, excluding the awn: 6-7 mm long, 1.5-2 mm broad, on short hairy pedicels. *Lower glume* ovate-lanceolate, acuminate, 4-5.5 mm long chartaceous, 1-nerved, *upper glume* ovate-acuminate, 6-7 mm long, 3-nerved, 1-keeled, keel scabrid, margins broad hyaline. *First (lowest) floret* male or barren; *lemma* 5-6 mm long, thin, membranous, 5-nerved, mid-nerve distinct, others faint, pilose with brown hairs, 2-lobed, lobes incised, awned in the sinus, awn up to or slightly exceeding the lemma; *palea* hyaline, linear-lanceolate, 4-5 mm long, 2-keeled, glabrous; *stamens* 3 or fewer, *anthers* 2-2.5 mm long. *Second (middle) floret* barren, lemma 4.5-6 mm long, oblong-lanceolate, obtuse, bifid, hairy, awned from the back at about the middle or lower down, awn slender, scabrid, geniculate, 6-9 mm long. *Third (upper) floret* hermaphrodite, lemma almost rotund, obtuse or acute and shortly aristate, 2.5-3 mm long, hyaline, very faintly 5-7 nerved; palea lanceolate, about 2 mm long; stamens 3 or 2; anthers 2-2.5 mm; stigmas 2, long, sometimes protruding beyond the floret; lodicules not seen.

INDIA: Tamil Nadu, Palnis, Pambar stream near Shenthadikanaal, 6-xii-1898, Bourne 1954.

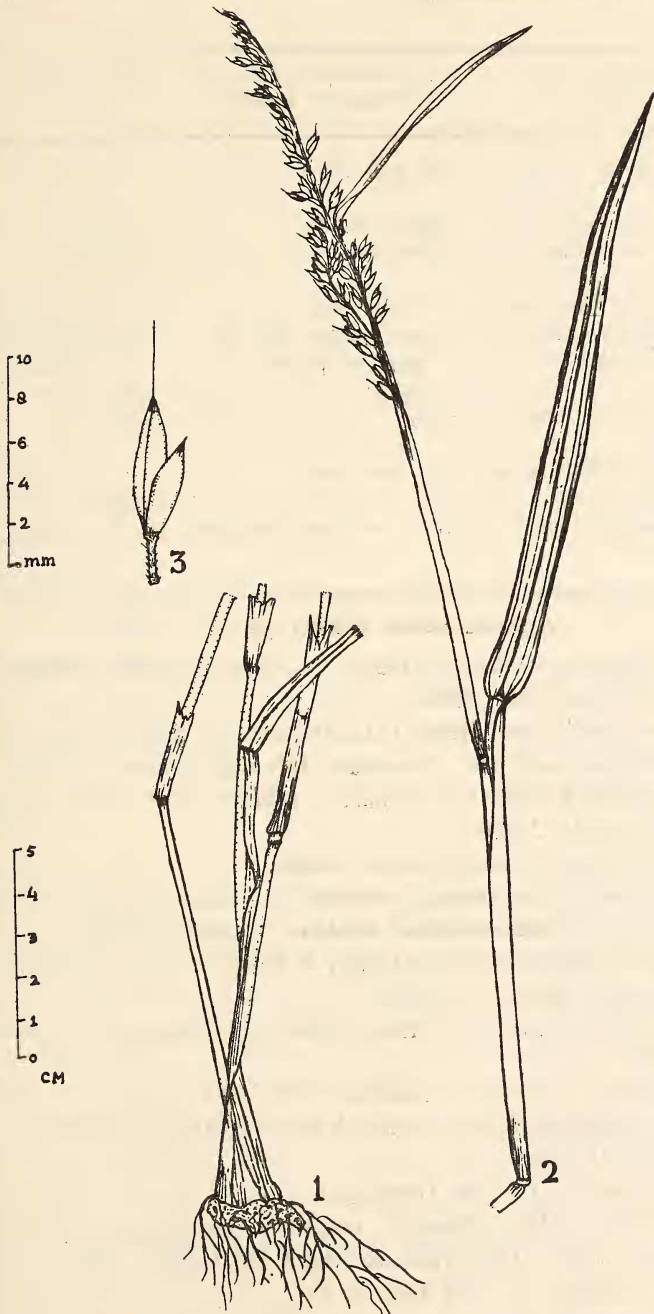
*Distribution:* India, so far endemic in Tamil Nadu.

*Etymology:* The grass is being named in honour of Dr. N. L. Bor, who first suspected this taxon to be new.

*Critical note:*

The third floret in our new species is normally unawned, but one of the sheets of Bourne (No. 1954, CAL 533452) shows the lemma of the third floret also shortly aristate. This character seems to be variable, as already recorded by Hubbard (p. 235) in an allied genus *Arrhenatherum* P. Beauv.

*Anthoxanthum borii* resembles on the one hand, *A. hookeri* (Griseb.) Rendle, and on the other, *A. clarkei* (Hook. f.) Ohwi. The following



Figs. 1-3. *Anthoxanthum borii*. 1. Base of plant; 2. Culm bearing leaf and inflorescence; 3. Spikelet.

table brings out the distinguishing characters between these species and should help in identification.

<i>Anthoxanthum borii</i> sp. nov.	<i>Anthoxanthum hookeri</i> (Griseb.) Rendle	<i>Anthoxanthum clarkei</i> (Hook. f.) Ohwi
Leaves up to 10 mm broad	4-6 mm broad	Up to 4 mm broad
Panicle congested	Panicle loose	Panicle loose
Pedicels of spikelets hairy	Glabrous	Glabrous
Spikelets 6-7 mm long	6-7 mm long	5.5 mm long
Lower glume about 2/3 of the upper	Lower glume half as long as upper or shorter	Lower glume 2/3 or more than 2/3 of the upper
First (lowest) floret male	Male	Neuter
Second (middle) lemma 4.5-6 mm long	4-6 mm long	3.45 mm long, brown pilose
Third (upper) lemma rotund	More or less lanceolate	More or less lanceolate

#### ***Anthoxanthum clarkei* (Hook. f.) Ohwi**

*Anthoxanthum clarkei* (Hook. f.) Ohwi in Bull. Tokyo Sci. Mus. 18:8, 1947; Bor, 431, 1960.

*Hierochloe clarkei* Hook. f. Fl. Br. Ind. 7:223, 1896; Bor, 167, 1940.

*Specimens examined*: Arunchal: Jabrang, 2744 m, 15-xi-1951, G. K. Deka (ASSAM 20945); Arunachal: Jabrang, 16-x-1955, Seshagiri Rao 1289, (ASSAM 20944).

*Distribution*: Eastern India, Burma.

*Etymology*: The species is named in honour of C. B. Clarke.

#### ***Anthoxanthum hookeri* (Griseb.) Rendle**

*Anthoxanthum hookeri* (Griseb.) Rendle in J. Linn. Soc. (Bot.) 36:380, 1904; Bor, 431, 1960.

*Hierochloe hookeri* (Griseb.) Clarke ex Hook. f. Fl. Br. Ind. 7:223, 1896.

*Specimens examined*: Sikkim, 2700-3600 m, J. D. Hooker s. n. (CAL) (Type); Sikkim: Zemu Valley, 2850 m, 9-vii-1909, Smith & Cave 1036 (CAL).

*Distribution*: Eastern Himalayas.

*Etymology*: This species is named in honour of J. D. Hooker.

*Critical note*: The grass described by Fischer (1846) under this name is actually *A. borii* Jain et Pal.

#### ***Anthoxanthum odoratum* L.**

*Anthoxanthum odoratum* L. Sp. Pl. ed. 1, 28, 1753; Hooker, 222;



Bor, 431, 1960; Hubbard, 271.

*Specimens examined:* Assam: Sept. 1936, *N. L. Bor* 13765 (ASSAM 32589); Meghalaya: Shillong, 1400-1500 m, 22-vi-1937, *N. L. Bor* s.n. (ASSAM 32590); Meghalaya: Shillong, 3-vi-1937, *G. K. Deka* 13998 (ASSAM 32592); Meghalaya: Shillong, 1500 m, 18-v-1938, *G. K. Deka* 20354 (ASSAM 32591); Meghalaya: Shillong 20-v-1957, *G. Panigrahi* 4780 (ASSAM 23269); Madras: Nilgiri, 2400 m, 24-i-1957, *K. M. Sebastine* 2214 (MH 4277); Madras: Kodaikanal, 19-iii-1950, *D. Daniel, S. Roy and J. S. Rao* s.n. (MH 93869); Madras: Ooty, 2220 m, 14-ix-1930, *V. Narayanaswami*, 4345 (MH 30312).

*Distribution:* All hilly regions of India; often cultivated; occasionally escape and run wild; Europe to Asia.

*Etymology:* The specific name refers to its odoriferous nature.

***Anthoxanthum puelii* Lecoq. et Lam.**

*Anthoxanthum puelii* Lecoq. & Lamotte Cat. Pl. France 385, 1847; Hubbard 269.

*A. aristatum* Boiss. Bor, 164, 1940.

The following sheets in the ASSAM herbarium bear the annotation *A. aristatum* Boiss.

1. Shillong, Morollos' Compound, 1-vi-1937, Bor 13997 (ASSAM 32593).

2. Shillong, Lake garden, 3-vi-1937, Deka 13998 (ASSAM 32594).

3. Shillong, 21-iv-1941, Dhar 20653 (ASSAM 32595).

The first two sheets have been identified by Bor; and sheet No. 1 bears a note by him "This is a European grass. Found in Morollos' Compound, 1-vi-37. Probably introduced and run wild. Sweet vernal grass—Bor".

The characters by which the grass differs from *A. odoratum* L. have been brought out in the key; these are based on Hubbard (p. 269), Hitchcock (p. 549) and Bor (p. 164, 1940). Our examination also shows that these specimens from Shillong agree with these characters.

It may be mentioned here that Hubbard (p. 269) has described this grass under the name *A. puelii* Lec. & Lam. He and Hitchcock (p. 818) have recorded that many authors consider *A. aristatum* Boiss. and *A. puelii* Lec. & Lam. to be synonymous.

This grass grows along with *A. odoratum* L.; Deka collected both species on 3-vi-1937 from the same spot, and erroneously gave the same field No. 13998 to both.

***Anthoxanthum sikkimense* (Maxim.) Ohwi**

*Anthoxanthum sikkimense* (Maxim.) Ohwi in Bull. Tokyo Sci. Mus. 18:8, 1947; Bor, 431, 1960.

*Hierochloe gracillima* Hook. f. Fl. Br. Ind. 7:223, 1896; Bor 166, 1940.

*Specimens examined*: Sikkim: 3300-3600 m, J. D. Hooker, s.n. (CAL) (Type).

*Distribution*: Eastern Himalayas.

*Etymology*: The species is named after its type locality, Sikkim.

#### CONSPECTUS OF SYNONYMOUS NAMES

The synonyms appearing in the foregoing account of the genus *Anthoxanthum* L. are listed below. Many binomials published under the genus *Anthoxanthum* L. refer to grasses which are not *Anthoxanthum* at all, but belong to other genera; several such names relate to grasses occurring in India and are included in following table:

Synonym	Correct Name
<i>Anthoxanthum aristatum</i> Boiss.	<i>Anthoxanthum puelii</i> Lec. & Lam.
<i>A. avenaceum</i> Retz.	<i>Dimeria avenacea</i> (Retz.) C.E.C. Fischer
<i>A. gracillimum</i> (Hook. f.) Mez	<i>Anthoxanthum sikkimense</i> (Maxim.) Ohwi
<i>A. indicum</i> L.	<i>Perotis indica</i> (L.) O. Ktze.
<i>Ataxia hookeri</i> Griseb.	<i>Anthoxanthum hookeri</i> (Griseb.) Rendle
<i>Hierochloe clarkei</i> Hook. f.	<i>A. clarkei</i> (Hook. f.) Ohwi
<i>H. hookeri</i> Maxim.	<i>A. hookeri</i> (Griseb.) Rendle
<i>H. hookeri</i> (Griseb.) Clarke ex Hook. f.	<i>A. hookeri</i> (Griseb.) Rendle
<i>H. sikkimensis</i> Maxim.	<i>A. sikkimense</i> (Maxim.) Ohwi
<i>H. gracillima</i> Hook. f.	- do -

#### ACKNOWLEDGEMENTS

We are grateful to the Director and Joint Director of Botanical Survey of India for facilities for these studies, and to the Regional Botanists for loaning some specimens from their herbaria (*MH*, *ASSAM*). Dr. M. P. Nayar has kindly provided the Latin diagnosis of the new species.

#### REFERENCES

- BOR, N. L. (1940): Flora of Assam 5 (Gramineae). Calcutta.
- (1960): The Grasses of Burma, Ceylon, India and Pakistan. London.
- CHASE, A. & NILES, C. D. (1962): Index to World Grasses, 3 Vols. Boston.
- FISCHER, C. E. C. (1934): Flora of the Presidency of Madras. 10.
- HITCHCOCK, A. S. (1950): Manual of the Grasses of the United States. Washington.
- HOOKE, J. D. (1896): The Flora of British India. 7. London.
- HUBBARD, C. E. (1968): Grasses. London.